

Changes to the NC Residential Code from the 2009 to 2012

Chapter 1 – Scope and Administration

R101.2 - Scope

The 2012 NCRC scope is the same as 2009 with the exception below that permits “Live/Work Units” to be built as one-and-two-family dwellings or townhouses.

Exception: Live/work units complying with the requirements of Section 419 of the NC Building Code shall be permitted to be built as one-and-two-family dwellings or townhouses. Fire suppression required by Section 419.5 of the NC Building Code when constructed under the NC Residential Code for One-and Two-Family Dwellings shall conform to Section 903.3.1.3 of the International Building Code.

Live/Work Unit is defined by the 2012 NC Building Code as “a dwelling unit or sleeping unit in which a significant portion of the space includes non-residential use that is operated by the tenant ...”.

Examples: Offices, hair styling shop or barber shop, small store, coffee shops, etc.

Exception: Home offices that comprise less than 10% of the dwelling unit.

Chapter 2 – Definitions

ATTIC, HABITABLE. A finished or unfinished attic area meeting the definition of Habitable Space and not considered a story, complying with all of the following Requirements:

1. The occupiable floor area is at least 70square feet (17m²), in accordance with Section R304.
2. The occupiable floor area has a ceiling height in accordance with Section R305, and
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and floor-ceiling assembly below.

SUNROOM ADDITION. A one-story structure added to an existing dwelling with a glazing area in excess of 40 percent of the gross area of the structure’s exterior walls and roof.

Note: Following are definitions that need to be synchronized with the energy code. First are a set of simple additions that are now referenced in Chapter 11. The second list contains modifications to existing definitions.

Additional definitions:

ACH50. Air Changes per Hour of measured air flow in relation to the building volume while the building is maintained at a pressure difference of 50 Pascals.

AIR BARRIER MATERIAL. Material(s) that have an air permeability not to exceed 0.004 cfm/ft² under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m² @ 75 Pa) when tested in accordance with ASTM E 2178.

AIR BARRIER SYSTEM. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier system is a combination of *air barrier materials* and sealants.

BPI ENVELOPE PROFESSIONAL. An individual that has successfully passed the Building Performance Institute written and field examination requirements for the Building Envelope certification.

CFM25. Cubic Feet per Minute of measured air flow while the forced air system is maintained at a pressure difference of 25 Pascals (0.1 inches w.p.)

CFM50. Cubic Feet per Minute of measured air flow while the building is maintained at a pressure difference of 50 Pascals (0.2 inches w.p.).

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

F-FACTOR. The perimeter heat loss factor for slab-on-grade floors (Btu/h x ft x °F) [W/(m x K)].

FULLY ENCLOSED ATTIC FLOOR SYSTEM– The ceiling insulation is enclosed on all six sides by an air barrier system, such as taped drywall below, solid framing joists on the sides, solid blocking on the ends, and solid sheathing on top which totally enclose the insulation. This system provides for full depth insulation over the exterior walls.

HEAT TRAP. An arrangement of piping and fittings, such as elbows, or a commercially available heat trap that prevents thermosiphoning of hot water during standby periods.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

HERS RATER. An individual that has completed training and been certified by RESNET (Residential Energy Services Network) Accredited Rating Provider.

HUMIDISTAT. A regulatory device, actuated by changes in humidity, used for automatic control of relative humidity.

INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

READILY ACCESSIBLE. Capable of being reached quickly for operation, renewal or inspection without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders or access equipment (see “*Accessible*”).

LAMP. The device in a lighting fixture that provides illumination, typically a bulb, fluorescent tube, or light emitting diode (LED).

SCREW LAMP HOLDERS. A lamp base that requires a screw-in-type lamp, such as a compact-fluorescent, incandescent, or tungsten-halogen bulb.

SEMI-CONDITIONED SPACE A space indirectly conditioned within the thermal envelope that is not directly heated or cooled. For energy purposes, semi-conditioned spaces are treated as conditioned spaces.

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

WALL, ABOVE-GRADE A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.

WALL, CRAWL SPACE. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

ZONE. A space or group of spaces within a building with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

Modified or updated definitions:

ACCESSIBLE. Signifies access that requires the removal of an access panel or similar removable obstruction. For energy purposes, ACCESSIBLE means admitting close approach as a result of not being guarded by locked doors, elevation or other effective means (see “Readily accessible”).

ADDITION. An extension or increase in floor area or height of a building or structure. For energy purposes, an extension or increase in the *conditioned space* floor area or height of a building or structure.

BASEMENT WALL. The opaque portion of a wall that encloses one side of a basement and has an average below grade wall area that is 50% or more of the total opaque and non-opaque area of that enclosing side. For energy purposes, a wall 50 percent or more below grade and enclosing *conditioned space*.

BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floor, roof, and any other building element that enclose *conditioned spaces*. This boundary also includes the boundary between *conditioned space* and any exempt or unconditioned space.

LABELED. Appliances, *equipment*, materials or products to which have been affixed a *label*, seal, symbol or other identifying *mark* of a nationally recognized testing laboratory, inspection agency, or other organization as approved by the NC Building Code Council concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the appliance, *equipment*, material or product meets identified standards or has been tested and found suitable for a specified purpose.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body building thermal envelope element body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \times ft^2 \times ^\circ F/Btu$) [$(m^2 \times K)/W$].

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted or convected into the space. This value is related to the Shading Coefficient (SC) by the formula $SHGC = 0.87 \times SC$. The solar heat gain through a fenestration or glazing assembly relative to the incident solar radiation ($Btu/h \times ft^2 \times ^\circ F$)

Chapter 3 – Building Planning

R301.1.1 – Alternative Provisions

Allows prescriptive design for log structures based on: *ICC-400 Standard on the design and Construction of Log Structures*.

Figure 301.2(4) – BASIC DESIGN WIND VELOCITIES FOR MOUNTAIN REGIONS

The 2009 footnotes to the mountain wind velocity table have been eliminated and the mountain wind speeds for 2012 are based on first floor finish elevation as follows:

Less than 2,700 feet	90 mph
2,700 to less than 3,000 feet	100 mph
3,000 to less than 3,500 feet	110 mph
3,500 to less than 4,500 feet	120 mph
4,500 feet or greater	130 mph

R301.2.1.2 – Protection of Openings

In addition to the 2009 windborne debris requirements, the following requirements are added for 2012:

1. Garage door glazed opening protection for windborne debris shall meet the requirements of an approved impact resistant standard or ANSI/DASMA 115.
2. The exception allowing use of wood panels for windborne debris protection requires that windborne debris “Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided.”

R302 – Fire Resistant Construction

For 2012, Section R302 has been renamed “Fire Resistant Construction” and includes fire resistance provisions that were previously (2009 code) located in other sections of the code.

Fire resistant provisions included in Section R302 are:

R302.1 - Exterior walls (previously “Location on Lot)

R302.2 and R302.3 - Townhouses and Two-family dwellings (previously R317.1 and R317.2)

R302.4 – Dwelling unit rated penetrations (previously R317.3)

R302.5 – Dwelling/garage opening /penetration protection (previously R309.1)

R302.6 - Dwelling/garage separation (previously R309.2)

R302.7 – Under-stair protection (previously R311.2.2)

R302.8 – Foam Plastics (references R316)

R302.9 – Flame spread index and smoke-developed index for wall and ceiling finishes (previously R315)

R302.10 - Flame spread index and smoke-developed index for insulation (previously R316)

R302.11 – Fireblocking (previously R602.8)

R302.12 - Draftstopping (previously R502.12)

R302.1 – Exterior Walls

“Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*. Townhouse projections shall comply with R302.2.5.
2. Walls of *dwellings* and *accessory buildings* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.”

**TABLE R302.1
EXTERIOR WALLS**

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	(Fire-resistance rated)	1 hour-tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	< 5 feet
	(Not fire-resistance rated)	0 hours	≥ 5 feet
Projections	(Fire-resistance rated)	1 hour on the underside	≥ 2 feet to 5 feet
	(Not fire-resistance rated)	0 hours	5 feet
Openings in walls	Not allowed	N/A	< 3 feet
	25% maximum of wall area	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R317.3	< 5 feet
		None required	5 feet

For SI: 1 foot = 304.8 mm.

N/A = Not Applicable.

R302.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

Exception: If an automatic residential fire sprinkler is installed, a common 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Section R302.4.

R302.2.1 Continuity. The fire-resistance-rated wall or assembly separating townhouses shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed accessory structures.

R302.2.2 Parapets. Parapets constructed in accordance with Section R302.2.3 shall be constructed for townhouses as an extension of exterior walls or common walls in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.
2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762 mm) above the lower roof, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface.

Exception: A parapet is not required in the two cases above when the roof is covered with a minimum class C roof covering, and the roof decking or sheathing is of noncombustible materials or approved fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of 5/8-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a minimum distance of 4 feet

(1220 mm) on each side of the wall or walls. No openings or penetrations including dormers allowed within this 4' protected area.

R302.2.3 Parapet construction. Parapets shall have the same fire-resistance rating as that required for the supporting wall or walls. On any side adjacent to a roof surface, the parapet shall have noncombustible faces for the uppermost 18 inches (457 mm), to include counter flashing and coping materials. Where the roof slopes toward a parapet at slopes greater than two units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a distance of 3 feet (914 mm), but in no case shall the height be less than 30 inches (762 mm).

R302.2.4 Structural independence. Each individual townhouse shall be structurally independent.

Exceptions:

1. Foundations supporting exterior walls or common walls.
2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.
3. Nonstructural wall coverings.
4. Flashing at termination of roof covering over common wall.
5. Townhouses separated by a common 2-hour fire-resistance-rated wall as provided in Section R302.2.

R302.5 Townhouse eave protection. In townhouse construction (with three or more attached dwellings) projections extending into the fire separation distance shall have not less than 1 hour fire resistive construction on the underside. Soffit material beyond the fire separation distance shall be securely attached to framing members and shall be constructed using either noncombustible soffit material; fire-retardant-treated soffit material; vinyl soffit installed over $\frac{3}{4}$ -inch (19 mm) wood sheathing or $\frac{5}{8}$ -inch (16 mm) gypsum board; or aluminum soffit installed over $\frac{3}{4}$ -inch (19 mm) wood sheathing or $\frac{5}{8}$ -inch (16 mm) gypsum board. Venting requirements shall be provided in both soffit and underlayments. Vents shall be either nominal 12-inch (51 mm) continuous or equivalent intermittent and shall not exceed the minimum net free air requirements established in Section R806.2 by more than 50 percent.

R302.2.6 Townhouse eaves. Overhang projections not exceeding 12 inches shall be allowed to extend beyond the property line in townhouse buildings provided all the following conditions are met:

1. Required fire resistant rated wall assembly is tight to roof deck; and
2. Eaves shall be protected with roof decking and fascia of non-combustible materials or approved fire-retardant-treated wood; and
3. Eaves shall have not less than 1 hour fire-resistive construction on the underside.

R302.2.7 Flame spread. Vinyl Siding and vinyl soffit materials when used in townhouse construction shall have a Flame Spread Index of 25 or less as tested in accordance with ASTM E-84.

R302.2.8 Sound transmission. See Appendix K

R302.3 Two-family dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119 or UL263. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

Exceptions:

1. A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.
2. Wall assemblies need not extend through attic spaces when the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board and an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the dwellings. The structural framing supporting the ceiling shall also be protected by not less than 1/2 -inch (12.7 mm) gypsum board or equivalent.

R302.3.1 Supporting construction. When floor assemblies are required to be fire-resistance-rated by Section R302.3, the supporting construction of such assemblies shall have an equal or greater fire-resistive rating.

R302.4 Rated penetrations. Penetrations of wall or floor/ceiling assemblies required to be fire-resistance rated in accordance with Section R302.2 or R302.3 shall be protected in accordance with this section.

R302.4.1 Through penetrations. Through penetrations of fire-resistance-rated wall or floor assemblies shall comply with Section R302.4.1.1 or R302.4.1.2

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space shall be protected as follows:

1. In concrete or masonry wall or floor assemblies, concrete, grout or mortar shall be permitted where installed to the full thickness of the wall or floor assembly or the thickness required to maintain the fire-resistance rating, provided:
 - 1.1. The nominal diameter of the penetrating item is a maximum of 6 inches (152 mm); and
 - 1.2. The area of the opening through the wall does not exceed 144 square inches (92900 mm²)
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (3 Pa) at the location of the penetration for the time period equivalent to the fire resistance rating of the construction penetrated.

R302.4.1.1 Fire-resistance-rated assembly. Penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

R302.4.1.2 Penetration firestop system. Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (3 Pa) and shall have an F rating of not less than the required fire-resistance rating of the wall or floor/ceiling assembly penetrated.

R302.4.2 Membrane penetrations. Membrane penetrations shall comply with Section R302.4.1. Where walls are required to have a fire-resistance rating, recessed fixtures shall be so installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) in any 100 square feet (9.29 m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall shall be separated as follows:

- 1.1 By a horizontal distance of not less than 24 inches (610 mm) where the wall or partition is constructed with individual noncommunicating stud cavities;
- 1.2 By a horizontal distance of not less than the depth of the wall cavity when the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
- 1.3 By solid fire blocking in accordance with Section R302.11
- 1.4. By protecting both boxes with listed putty pads; or
- 1.5. By other listed materials and methods.

2. Membrane penetrations by listed electrical boxes of any materials provided the boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall shall be separated as follows:

- 2.1. By a horizontal distance of not less than 24 inches (610 mm) except at walls or partitions constructed using parallel rows of studs or staggered studs;
- 2.2. By solid fire blocking in accordance with Section R302.11
- 2.3. By protecting both boxes with listed putty pads; or
- 2.4. By other listed materials and methods.

3. The annular space created by the penetration of a fire sprinkler provided it is covered by a metal escutcheon plate.

R302.5 Dwelling/garage opening/penetration protection. Openings and penetrations through the walls or ceilings separating the dwelling from the garage shall be in accordance with Sections R302.5.1 through R302.5.3

R302.5.1 Opening protection. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 13/8 inches (35 mm) in thickness, solid or honeycomb core steel doors not less than 13/8 inches (35 mm) thick, or 20-minute fire-rated doors.

R302.5.2 Duct penetration. Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other approved material and shall have no openings into the garage.

R302.5.3 Other penetrations. Penetrations through the separation required in Section R309.2 shall be protected as required by Section R302.11, Item 4.

R302.6 Dwelling/garage fire separation. The garage shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. This provision does not apply to garage walls that are perpendicular to the adjacent dwelling unit wall.

Table R302.6 Dwelling/Garage Separation	
Separation	Material
From the residence and attics	Not less than ½-inch gypsum board or equivalent applied to the garage side
From all habitable rooms above the garage	Not less than 5/8-inch Type X gypsum board or equivalent
Structure(s) supporting assemblies used for separation required by this section	Not less than ½-inch gypsum board or equivalent
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than ½-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

R302.7 Under stair protection. Enclosed accessible space under stairs shall have walls, under stair surface and any soffits protected on the enclosed side with 1/2-inch (13 mm) gypsum board.

R302.8 Foam plastic. For requirements for foam plastics see Section R316.

R302.9 Flame spread index and smoke-developed index for wall and ceiling finishes. Flame spread and smoke index for wall and ceiling finishes shall be in accordance with Sections R302.9.1 through R302.9.4.

R302.9.1 Flame spread index. Wall and ceiling finishes shall have a flame-spread index of not greater than 200.

Exception: Flame-spread index requirements for finishes shall not apply to trim defined as picture molds, chair rails, baseboards and handrails; to doors and windows or their frames; or to materials that are less than 1/28 inch (0.91 mm) in thickness cemented to the surface

of walls or ceilings if these materials exhibit flame-spread index values no greater than those of paper of this thickness cemented to a noncombustible backing.

R302.9.2 Smoke-developed index. Wall and ceiling finishes shall have a smoke-developed index of not greater than 450.

R302.9.3 Testing. Tests shall be made in accordance with ASTM E 84 or UL723.

R302.9.4 Alternate test method. As an alternate to having a flame-spread index of not greater than 200 and a smoke developed index of not greater than 450 when tested in accordance with ASTM E 84 or UL 723, wall and ceiling finishes, other than textiles, shall be permitted to be tested in accordance with NFPA 286. Materials tested in accordance with NFPA 286 shall meet the following criteria:

During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Item 3.

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. During the 160 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
 - 2.2. Flashover, as defined in NFPA 286, shall not occur.
3. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m².

R302.11 Fireblocking. In combustible construction, fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space.

Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
 - 1.1. Vertically at the ceiling and floor levels.
 - 1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials.

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
5. One-half inch (12.7 mm) gypsum board
6. One-quarter inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.

R302.11.1.1. Batts or blankets of mineral or glass fiber. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

R302.11.1.2 Unfaced fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

R302.11.1.3 Loose-fill insulation material. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

R302.11.2 Fireblocking integrity. The integrity of all fireblocks shall be maintained.

R302.12 Draftstopping required. In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 square feet (92.9 m²). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor framing.
2. Floor framing is constructed of truss-type open-web or perforated members.

R302.12.1 Materials. Draftstopping materials shall not be less than 1/2-inch (12.7 mm) gypsum board, 3/8-inch (9.5 mm) wood structural panels, 3/8-inch (9.5 mm) Type 2-M-W particleboard or other approved materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise approved by the building official. The integrity of all draftstops shall be maintained.

R302.13 Combustible insulation clearance. Combustible insulation shall be separated a minimum of 3 inches (76 mm) from recessed luminaires, fan motors and other heat producing devices.

Exception: Where heat-producing devices are listed for lesser clearances, combustible insulation complying with the listing requirements shall be separated in accordance with the conditions stipulated in the listing.

Recessed luminaires installed in the building envelope shall meet the requirements of Section N1102.4.5.

R305.1, Exception 2 – “Bathrooms shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) at the center of the front clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose...”

The measurement for the ceiling height at bathroom fixtures is taken at the front of the fixture at the center of the clearance area shown in Figure R307.1.

R305.1, Exception 2 - Minimum Ceiling Height at Bathroom Fixtures		
Bathroom Fixture	Minimum Required Front Clearance	Location of Ceiling Height Measurement
Toilet	21 inches from front rim	10.5 inches from front rim
Lavatory	21 inches from front of hanging basin or lavatory base	10.5 inches from front of hanging basin or lavatory base
Tub without showerhead	21 inches from entrance edge of tub	10.5 inches from entrance edge of tub
Shower (includes tub with showerhead)	24 inches at front of opening	Above a minimum area of 30 inches by 30 inches at the showerhead
Minimum Required Ceiling Height is 6 feet 8 inches		

R310.1 Emergency escape and rescue required

The 2012 code requires that all basements (not just those with habitable space), habitable attics, and all sleeping rooms must have an emergency escape and rescue opening. There is an exception for basements used only to house mechanical equipment and not exceeding total floor area of 200 square feet (18.58 m²).

R311.2 Egress door.

1. The method of measuring the required egress door is changed for 2012 as follows.
 - a. Only one egress door is required to be side hinged and meet the minimum dimensions.
 - b. Sets new minimum width and height clearances (32" clear width and 78" clear height).
 - c. Sets locations from which to measure clearances (face of open door to face of stop for width and top of threshold to face of top stop for height).
2. Requires that all interior egress doors and only the required exterior egress door to be readily operable from the side which egress is made without the use of a key or special knowledge (allows all exterior egress doors except the required egress door to have double cylinder dead bolts).

R311.4 Vertical egress

Requires that egress from all habitable levels (including habitable attics and basements) be by an egress door in accordance with R311.2 or by a ramp in accordance with R311.8 or by a stairway in accordance with R311.7. The only exception is use of a ladder for egress to/from equipment platforms as allowed by the exception to R311.1 (2009 and 2012 NCRC).

R312.1 Where required

Where guards are required to be located along open-sided walking surfaces, stairs, ramps and landings, that are located more than 30 inches above the floor or grade below, the vertical measurement is to be taken to the lowest point up to 36 inches horizontally from the edge of the walking surface.

R312.2 Height

Additional code language is added to this section that requires the 36" guard height to be measured from the top of any fixed seating immediately adjacent to the rail.

R312.3 Opening limitations

Guards may not allow the passage of a 4-inch sphere (2009 code allowed passage of up to a 6-inch sphere in intermediate rails or ornamental enclosures). The 2009 exceptions for stair sides and the triangular openings created by a tread and riser are still applicable.

R313.1 Townhouse Automatic Fire Sprinkler Systems. An automatic residential fire sprinkler system shall be installed in townhouses.

Exceptions:

1. Townhouses constructed with a common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263 provided such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations for electrical outlet boxes shall be in accordance with Section R302.4.
2. An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed

R314 – Smoke alarms

The 2009 NCRC Section R313 Smoke alarms is changed to Section R314 in the 2012 NCRC. The text of previous sections R313.1 and R313.2 are unchanged (there are section number changes); however, the previous sections R313.2.1 through R313.3 have been renumbered and rewritten as follows:

R314.3.1 Alterations, repairs, and additions. When alterations, repairs and additions requiring a building permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings; the smoke alarms shall be interconnected and hard wired.

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section.
2. Installation, alteration or repairs of plumbing or mechanical systems are exempt from the requirements of this section.

R314.4 Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke alarms shall be interconnected.

Exceptions:

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.
2. Interconnection and hard-wiring of smoke alarms in existing areas shall not be required where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure. Smoke alarm locations are required per Section R314.2, but may be battery powered and shall be designed to emit a recurring signal when batteries are low and need to be replaced.

R315 – Carbon Monoxide Alarms

Carbon Monoxide alarms are addressed in the 2012 NCRC as Section R415 as follows:

R315.1 Carbon monoxide alarms. In new construction, dwelling units shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).

R315.2 Where required in existing buildings.

R315.2 Where required in existing buildings. In existing dwellings, where interior alterations, repairs, fuel-fired appliance replacements or additions work requiring a permit occurs, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section 315.1.

Exception:

Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, or the installation of a fuel-fire appliance that cannot introduce carbon monoxide to the interior of the dwelling, are exempt from the requirements of this section.

R315.3 Alarm requirements. The required carbon monoxide alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

R317 – Protection of Wood and Wood Based Products Against Decay

R317.1 Location required. Protection of wood and wood based products from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPAC U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPAC U1

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.
2. All wood exterior sills and plates that rest on concrete or masonry exterior foundation walls.
3. Sills and sleepers on a concrete or masonry slab, unless the slab that is in direct contact with the ground is separated from the ground by an approved impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than 0.5 inch (12.7 mm) on tops, sides and ends.
5. Wood siding and sheathing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground.
6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.
7. Wood furring strips or other wood framing members attached directly to the interior of exterior masonry walls or concrete walls below grade except where an approved vapor retarder is applied between the wall and the furring strips or framing members.
8. All portions of a porch, screen porch or deck from the bottom of the header down, including posts, guardrails, pickets, steps, and floor structure. Coverings that would prevent moisture or water accumulation on the surface or at joints between members are allowed.

Exception: Columns complying with R317.1.4, Exception #2

R317.1.4 Wood columns. Wood columns shall be approved wood of natural decay resistance or approved pressure-preservative-treated wood.

Exceptions:

1. Columns in basements when supported by a concrete floor with an approved impervious moisture barrier installed between the slab and earth
2. Columns exposed to the weather when all of the following conditions are met:
 - a. The column is supported by piers or metal pedestals projecting 1 inch (25.4 mm) above the concrete floor or 6 inches (152 mm) above exposed earth and the earth is covered by an approved impervious moisture barrier; and
 - b. There is no joints in or between structural members (from the header to the base of the column); and
 - c. The column is protected from exposure to surface moisture at the top by a roof, eave, or overhang; and
 - d. The exterior surface of the column is fully sealed (paint, sealer, etc.) against moisture intrusion.
3. Columns in crawl spaces or excavated areas located within the periphery of the building when supported by a concrete pier or metal pedestal at a height more than 8 inches (203 mm) from exposed earth and the earth is covered by an impervious barrier.

R317.3.1 Fasteners for preservative treated wood

Fasteners must be hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Coating types and weights shall be in accordance with the connector manufacturer's recommendations, or a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent.

Exceptions allowed to fastener coating requirements are one-half inch or greater steel bolts and other than nail, timber rivets, and fasteners with mechanically deposited zinc-coated steel meeting ASTM B 695, Class 55.

R323 – Storm Shelters

A new section is included in the 2012 NCRC addressing storm shelters. Storm shelters are not required but when built, must comply with ICC/NSSA-500

Chapter 4 – Foundations

TABLE R403.
MINIMUM WIDTH OF CONCRETE OR MASONRY FOOTINGS
(inches)^a

		LOAD BEARING VALUE OF SOIL (psf)			
		1,500	2,000	3,000	4,000
Conventional Wood Frame Construction					
<i>1-story</i>	16 12 ^b	16 12 ^b	12	12	12
<i>2-story</i>	16 15 ^b	16 15 ^b	12	12	12
<i>3-story</i>	23	17	12	12	12
4-Inch Brick Veneer Over Wood Frame or 8-Inch Hollow Concrete Masonry					
<i>1-story</i>	16 12 ^b	16 12 ^b	12	12	12
<i>2-story</i>	16 15 ^b	16 15 ^b	12	12	12
<i>3-story</i>	32	24	16	12	12
8-Inch Solid or Fully Grouted Masonry					
<i>1-story</i>	16	16	12	12	12
<i>2-story</i>	29	21	14	12	12
<i>3-story</i>	42	32	21	16	16

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Where minimum footing width is 12 inches, use a single width of solid or fully grouted 12-inch nominal concrete masonry units is permitted.

b. A minimum footing width of 12" is acceptable for monolithic slab foundations.

Figure R403.3(1) - Concrete and Masonry Foundation Details

For 2012, Note 1 is revised to read: Foundations shall extend not less than 12 inches below ~~the natural grade or engineered fill~~ finished grade and in no case less than the frost line depth.

R403.4 – Footings for precast concrete foundations

The 2012 NCRC includes prescriptive footings (crushed stone or concrete) that may be used for precast concrete foundations.

R403.4.1 – Crushed Stone Footings

Crushed stone footings for precast concrete foundations must meet the following:

1. Stone must be angular and meet ASTM C 33
2. Maximum stone size ½ inch
3. Stone must be angular and meet ASTM C 33
4. Stone size – 1/16 inch minimum to ½ inch maximum
5. Stone depth must be per Table 403.4
6. Footing width per manufacturer's instructions
7. Stone must be installed per Figure R403.4(1)
8. Stone must be consolidated using a vibratory plate – maximum 8 inch lifts

R403.4.2 – Concrete Footings

Concrete footings for precast concrete foundations must be installed per the general footing requirements of R403.1 and the footing must be installed per Figure 403.4(2) which requires the walls to be set in a bed of non-shrinking grout on the footing.

R404.5 – Precast concrete foundation walls

The 2012 NCRC includes prescriptive requirements for precast concrete foundation walls.

R404.5.1 – Design and R404.5.2 – Precast concrete foundation design drawings

Precast concrete foundation walls shall be designed in accordance with accepted engineering practice for the specific site conditions. The precast concrete foundation wall design drawings must be submitted to the building official and must include:

1. Design loading
2. Footing design and material (may be prescriptive as allowed by R403.4 or engineered)
3. Concentrated loads and points of application
4. Soil-bearing capacity
5. Maximum allowable uniform load
6. Seismic design category
7. Design wind speed

R404.5.3 – Precast concrete foundation walls

Requires that each wall panel be identified by a certificate of inspection label issued by an approved third party inspection agency.

R406.4 – Precast concrete foundation system dampproofing

Requires that precast concrete foundations must meet the dampproofing and waterproofing requirements of R406.1 and R406.2.

408.1.1 Foundation vent sizing. The minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m²) for each 150 square feet (13.9 m²) of crawl space ground area.

Exception: The total area of ventilation openings may be reduced to 1/1,500 of the ~~of the crawl space ground area~~ under-floor area where the ground surface is treated with an approved vapor retarder material in accordance with Section R408.2 and the required openings are placed so as to provide cross-ventilation of the space. The installation of operable louvers shall not be prohibited.

R408.2 Ground vapor retarder. ~~Requires full coverage ground vapor retarders for all wall vented ground spaces. Wall vented crawl spaces shall be protected from water entry by the evaporation of water from the ground surface.~~ A minimum 6-mil (0.15 mm) polyethylene vapor retarder or equivalent shall be installed to nominally cover all exposed earth in the crawl space with joints lapped not less than 12 inches (305 mm). Where there is no evidence that the ground water table can rise to within 6 inches (152 mm) of the floor of the crawl space it is acceptable to puncture the ground vapor retarder at low spots to prevent water puddles from forming on top of the vapor retarder due to condensation. ~~The floor of the crawl space shall be graded so that it drains to one or more low spots.~~ Install a drain to daylight or sump pump at each low spot. Crawl space drains shall be kept separate from roof gutter drain systems and foundation perimeter drains.

Chapter 5 – Floors

From the 2009 NCRC to the 2012 NCRC There Were No Significant Changes in Chapter 5

Chapter 6 – Wall Construction

Table R602.3(1) and Table R602.3(1a) – Fastening schedules

A new fastener Table R602.3(1a) has been added. The new table includes power driven fasteners. The new table (in rough draft form) can be found at web link below. Upon opening the link proceed to Chapter 6-Wall Construction.

http://www.ncdoi.com/OSFM/Engineering/BCC/Documents/2012_NCBuildingCode_amendments/ResidentialCode-2012NCAmendments100517.pdf

R602.3.5 thru R602.3.5.2.2 – Fasteners

R602.3.5 thru R602.3.5.2.2 are new code sections that:

1. Requires nails and staples to conform to ASTM F 1667
2. Provides specific requirements for staples
3. Provides specific requirements for nails (hand driven and power driven)

R602.10 – Wall bracing

R602.10 has been completely rewritten and the text, tables, and diagrams for this section may be viewed at the ICC web site at the link below:

http://publicecodes.citation.com/icod/irc/2009/icod_irc_2009_6_sec002_par020.htm?bu=IC-P-2009-000002&bu2=IC-P-2009-000019

R612.2 thru R612.4

Window fall prevention protection

If any part of the clear opening of the operable portion of a window is located more than 72 inches above the exterior grade then the lowest part of the clear opening must be at least 24 inches above the floor of the room in which it is located.

Exceptions:

1. The window is a fixed unit.
2. The opening does not allow the passage of a 4- inch diameter sphere.
3. The window is equipped with a window fall prevention device meeting ASTM F 2090.
4. The window is equipped with an approved window opening limiting device

Note: When used with an emergency escape and rescue window, opening limiting devices and fall prevention devices must be approved for emergency escape and rescue provisions.

Chapter 7 – Wall Covering

From the 2009 code to the 2012 Code There Were No Significant Changes in Chapter 7

Chapter 8 – Roof-Ceiling Construction

R802.3 Framing details. Rafters shall be framed to ridge board or to each other with a gusset plate as a tie. Ridge board shall be at least 1-inch (25.4 mm) nominal thickness and not less in depth than the cut end of the rafter. Opposing rafters at the ridge must align within the thickness of the ridge member. Regularly spaced hip and valley rafters need not align. At all valleys and hips there shall be a valley or hip rafter not less than 2-inch (51 mm) nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be supported at the ridge by a brace to a bearing partition or be designed to carry and distribute the specific load at that point. Where the roof pitch is less than three units vertical in 12 units horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams.

R802.3.1 – Ceiling joist and rafter connections

2006 and prior year edition code language was reinserted in the 2012 code that allows rafter ties to be spaced up to 48 inches on center.

R807.1 Attic access. An attic access opening shall be provided to attic areas that exceed ~~100~~ 400 square feet (9.29 m²) and have a vertical height of 60 inches (1524 mm) or greater. The net clear opening shall not be less than 20 inches by 30 inches (508 mm) by 762 mm) and shall be located in a hallway or other readily accessible location. A 30-inch (762 mm) minimum unobstructed headroom in the attic space shall be provided at some point above the access opening. See Section MI305.1.3 for access requirements where mechanical equipment is located in attics.

Exception: Concealed areas not located over the main structure including porches areas behind knee walls, dormers, bay windows etc. are not required to have access.

Chapter 9 – Roof Assemblies

R905.2.4.1 – Wind resistance of asphalt shingles

Additional requirements have been added relative to asphalt shingles as follows:

1. Asphalt shingle packaging must bear a label to indicate the wind classification
2. Asphalt shingles being installed must meet the appropriate wind classifications of Table R905.2.4.1(1) or Table R905.2.4.1(2)
3. For wind resistance, asphalt shingles must be classified per ASTM D 7158 or ASTM D3161

Exception

Asphalt shingles not included in the scope ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table R905.2.4.1(2)

TABLE R905.2.4.1(1)
CLASSIFICATION OF ASPHALT ROOF SHINGLES PER ASTM D 7158

MAXIMUM BASIC WIND SPEED FROM FIGURE 301.2(4) (mph)	CLASSIFICATION REQUIREMENT
85	D, G or H
90	D, G or H
100	G or H
110	G or H
120	G or H
130	H
140	H
150	H

For SI: 1 mile per hour = 0.447 m/s.

TABLE R905.2.4.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161

MAXIMUM BASIC WIND SPEED FROM FIGURE 301.2(4) (mph)	CLASSIFICATION REQUIREMENT
85	A, D or F
90	A, D or F
100	A, D or F
110	F
120	F
130	F
140	F
150	F

R905.8.6 – Application (Wood shakes)

Spacing between shakes in the same course is increased from 1/8 inch to 3/8 inch (2009 code) to 3/8 inch to 5/8 inch in the 2012 code.

Chapter 10 – Chimneys and Fireplaces

From the 2009 code to the 2012 Code There Were No Significant Changes in Chapter 10

Chapter 11 – Energy Efficiency

Chapter 11 has been completely rewritten for 2012 and the complete text for this chapter may be downloaded at the following web link.

http://www.ncdoi.com/OSFM/Engineering/BCC/Documents/2012_NCBuildingCode_amendments/2012NCResidentialEnergy101214RRCOSBM.pdf

Chapter 45 – High Wind Zones

The 2006 Chapter 44 is Chapter 45 in the 2012 code with the following underlined changes:

4504.4 Exterior Concrete Slab-on-grade Footings. Vertical reinforcement shall be installed at intervals not to exceed Table 4404.1.1 and shall terminate in a double sole plate.

Exception: Vertical reinforcement (anchorage) shall be installed at intervals not to exceed Table 4401.1a. where the bars terminate in a single sole plate. Approved strap anchors or wood structural panels shall be installed to provide a continuous load-path from the single sole plate to the wall.

4506.3 Gable endwalls. Gable endwalls in the 110, 120, and 130 mph (48 m/s, 53 m/s, 57 m/s) wind zones shall either be supported by lateral bracing at the ceiling or have continuous studs from the floor to the roof. 2 x 4 studs at 16 inches (406 mm) on center are limited to 10 feet (3048) in length between supports. Nonbearing 2 x 6 SPF No.2 studs at 16 inches (406 mm) on center with 3/8 inch wood structural panel sheathing are limited to unsupported lengths of 18 feet (5486) in 110 mph (48 m/s), 16 feet (4877) in 120 mph (53 m/s) and 14 feet (4267 mm) in 130 mph (57 m/s) wind zones. Wood structural panel sheathing shall extend 12 inches (305 mm) beyond horizontal construction joints except where the horizontal joint occurs over minimum 1 inch (25 mm) thick OSB or plywood rimboard with a minimum 1-1/2 inch (38 mm) overlap.

4508.4 Anchorage using wood structural panels. Wood structural panel sheathing may be used to resist both lateral load and uplift simultaneously. Panels shall be installed as follows:

1. Panels may be installed with face grain parallel or perpendicular to studs.
2. Panels shall be 3/8 inch (9 mm) minimum thickness.
3. Nail spacing shall be 8d at 6 inches (152 mm) on center along vertical edges of panel and 12 inches (305 mm) at intermediate vertical framing.
4. Horizontal nail spacing at double row of 8d staggered at 3 inches (76 mm) on center.
5. Panel shall extend 12 inches (305 mm) beyond horizontal construction joints and shall overlap girders their full depth except where the horizontal joint occurs over minimum 1 inch (25 mm) thick OSB or plywood rimboard with a minimum 1-1/2 inch (38 mm) overlap.

6. Panel attachment to framing shall be as illustrated in Figure 4408.4.
7. Blocking shall be required at all joints if sheathing is used to resist uplift.

Chapter 46 – Coastal and Flood Plane Construction Standards

The 2009 Chapter 45 is Chapter 46 in the 2012 code with the following changes:

The 2009 code section 4505.7 is deleted for 2012

Roofing in coastal and flood plain areas must meet the requirements of Chapter 9 for 2012